AMENDMENTS TO THE CLAIMS

1. (Original) A method for multiplexing and transmitting a signaling message and/or supplementary data with a voice signal to be transmitted to a mobile station in a mobile communication system which includes a media gateway and a base station controller, the media gateway including a trans-coder for converting an analog voice signal and a coded digital voice signal into each other, the base station controller transmitting/receiving a digital voice signal to/from the media gateway, the method comprising the steps of:

transmitting information of the voice signal and a transmission rate of a voice signal, which are transmitted from the mobile station, from the base station controller to the media gateway;

transmitting information of a voice signal and a transmission rate of the voice signal, which are transmitted from a called party, from the media gateway to the base station controller; and

checking whether or not there is a signaling message and/or supplementary data to be transmitted to the mobile station by the base station controller while the base station controller is transmitting/receiving the voice signal, and multiplexing and transmitting the signaling message and/or the supplementary data with the voice signal to the mobile station when there is the signaling message and/or the supplementary data to be transmitted.

2. (Original) The method as claimed in claim 1, further comprising a step of inserting the signaling message and/or the supplementary data instead of the voice signal to be transmitted into a transmission section for the voice signal and transmitting the signaling message and/or the supplementary data to the mobile station, when the transmission rate of the voice signal transmitted from the media gateway to the base station controller is not reduced during a predetermined period of time.

3. (Original) The method as claimed in claim 2, wherein the signaling message and/or the supplementary data transmitted instead of the voice signal to the mobile station are transmitted at a full rate.

4. (Original) The method as claimed in claim 1, wherein, the step of multiplexing and transmitting the signaling message and/or the supplementary data with the voice signal comprises the steps of:

requesting that the media gateway reduces a transmission rate during a predetermined period of time; and

receiving a response to transmission-rate reduction from the media gateway and transmitting the voice signal and the signaling message and/or the supplementary data to the mobile station by multiplexing the signaling message and/or the supplementary data with the voice signal according to a reduced transmission rate.

5. (Currently Amended) The method as claimed in claim 4 ~~claim 3~~, wherein, in the step of requesting that the media gateway reduces a transmission rate of the voice signal, a transmission-rate reduction request for a predetermined period of time is recorded in a reverse frame message, and the reverse frame message is transmitted together with a transmission frame of a predetermined frame protocol.

6. (Original) The method as claimed in claim 5, wherein, the reverse frame message is transmitted through an interface for transmitting data frames of the voice signal, and includes a reverse layer-3 data information which includes an information element for a reduction request and/or an information element for time for transmission-rate reduction time.

7. (Original) The method as claimed in claim 3, wherein, a transmission-rate reduction request message is transmitted through a second interface which is established separately from a first interface through which data frames of the voice signal are transmitted, and includes information for transmission-rate reduction and/or an information element for transmission-rate reduction time, and/or information for an identification number of the mobile station.

8. (Original) The method as claimed in claim 7, wherein, the transmission-rate reduction request message is transmitted through the second interface which is established separately from the first interface through which data frames of the voice signal are transmitted, and includes information of transmission-rate reduction and information of the identification number of the mobile station.

9. (Original) A method for multiplexing and transmitting a signaling message and/or supplementary data with a voice signal to a mobile station by a base station controller in a mobile communication system which includes a media gateway and the base station controller, the media gateway including a trans-coder for converting an analog voice signal and a coded digital voice signal into each other, the base station controller transmitting/receiving a digital voice signal to/from the media gateway, the method comprising the steps of:

judging whether or not there is the signaling message and/or the supplementary data besides of the voice signal;

requesting that the media gateway reduces a transmission rate of the voice signal during a predetermined period of time when there is the signaling message and/or the supplementary data; and

receiving a response to transmission-rate reduction of the voice signal from the media gateway and transmitting the voice signal and the signaling message and/or the supplementary data to the mobile station by multiplexing the signaling message and/or the

supplementary data with the voice signal according to a reduced transmission rate.

10. (Original) The method as claimed in claim 9, wherein, in the step of requesting that the media gateway reduces a transmission rate of the voice signal, a transmission-rate reduction request for a predetermined period of time is recorded in a reverse frame message, and the reverse frame message is transmitted together with a transmission frame of a predetermined frame protocol.

11. (Original) The method as claimed in claim 10, wherein, the reverse frame message is transmitted through an interface for transmitting data frames of the voice signal, and includes a reverse layer-3 data information which includes an information element for a reduction request and/or an information element for transmission-rate reduction time.

12. (Original) The method as claimed in claim 9, wherein, in the step of requesting that the media gateway reduces a transmission rate of the voice signal, a transmission-rate reduction request for a predetermined period of time is recorded in a transmission-rate reduction request message, and the transmission-rate reduction request message is transmitted separately from a transmission frame of a frame protocol.

13. (Original) The method as claimed in claim 12, wherein, the transmission-rate reduction request message is transmitted through a second interface which is established separately from a first interface through which data frames of the voice signal are transmitted, and includes information of transmission-rate reduction and/or an information element for transmission-rate reduction time, and/or information of an identification number of the mobile station.

14. (Original) A method for reducing a transmission rate of a voice signal so that a media gateway can multiplex and transmit the voice signal and a signaling message and/or supplementary data to a mobile station in a mobile communication system which includes the media gateway and a base station controller, the media gateway including a trans-coder for converting an analog voice signal and a coded digital voice signal into each other, the base station controller transmitting/receiving a digital voice signal to/from the media gateway, the method comprising the steps of:

reducing a transmission rate of the voice data when the base station controller requests transmission-rate reduction of the voice signal; and

transmitting a response to the voice signal transmission-rate reduction request to the base station controller within a predetermined period of time.

15. (Original) The method as claimed in claim 14, wherein, a resultant of the reduced transmission rate is record in a forward frame message, and the forward frame message is transmitted together with a transmission frame of a frame protocol.

16. (Original) The method as claimed in claim 15, wherein, the forward frame message is transmitted through an interface for transmitting data frames of the voice signal, and includes a forward layer-3 data information which includes a resultant information element for transmission-rate reduction and/or an information element for the predetermined transmission-rate reduction time period.

17. (Original) The method as claimed in claim 14, wherein, a resultant of the reduced transmission rate is record in a transmission-rate reduction response message, and the transmission-rate reduction response message is transmitted separately from a transmission frame of a frame protocol.

18. (Original) The method as claimed in claim 17, wherein, the transmission-rate reduction response message is transmitted through a second interface which is established separately from a first interface through which data frames of the voice signal are transmitted, and includes resultant information of transmission-rate reduction and/or an information element for transmission-rate reduction time and/or information of an identification number of the mobile station, and/or information of failure cause.

19. (Original) A system for multiplexing and transmitting a signaling message and/or supplementary data with a voice signal to be transmitted to a mobile station in a mobile communication system which includes a media gateway and a base station controller, the media gateway including a trans-coder for converting an analog voice signal and a coded digital voice signal into each other, the base station controller transmitting/receiving a digital voice signal to/from the media gateway, the system comprising:

the media gateway for transmitting information of a voice signal and a transmission rate of the voice signal, which are transmitted from a called party, to the base station controller; and

the base station controller for transmitting information of a voice signal and a transmission rate of the voice signal, which are transmitted from the mobile station, to the media gateway, checking whether or not there is a signaling message and/or supplementary data to be transmitted to the mobile station while the base station controller is transmitting/receiving the voice signal, and multiplexing and transmitting the signaling message and/or the supplementary data with the voice signal to the mobile station when there is the signaling message and/or the supplementary data to be transmitted.

20. (Original) The system as claimed in claim 19, wherein the base station controller inserts the signaling message and/or the supplementary data instead of the voice signal to be transmitted into a transmission section for the voice signal and transmits the signaling message and/or the supplementary data to the mobile station, when the transmission rate of the voice signal transmitted from the media gateway to the base station controller is not reduced during a predetermined period of time.

21. (Original) The system as claimed in claim 20, wherein the signaling message and/or the supplementary data transmitted instead of the voice signal to the mobile station are transmitted at a full rate.

22. (Original) The system as claimed in claim 19, wherein, the base station controller requests that the media gateway reduces a transmission rate during a predetermined period of time, receives a response to transmission-rate reduction from the media gateway, and transmits the voice signal and the signaling message and/or the supplementary data to the mobile station by multiplexing the signaling message and/or the supplementary data with the voice signal according to a reduced transmission rate.

23. (Original) The system as claimed in claim 19, wherein, in order to request that the media gateway reduces a transmission rate of the voice signal the base station controller records a transmission-rate reduction request for a predetermined period of time in a reverse frame message, and transmits the reverse frame message with a transmission frame of a predetermined frame protocol.

24. (Original) The system as claimed in claim 23, wherein, the reverse frame message is transmitted through an interface for transmitting data frames of the voice signal, and includes a reverse layer-3 data information which includes an information element for a reduction request and/or an information element for transmission-rate reduction time.

25. (Original) The system as claimed in claim 19, wherein, in order to request that the media gateway reduces a transmission rate of the voice signal, the base station controller records a transmission-rate reduction request for a predetermined period of time in a transmission-rate reduction request message, and transmits the transmission-rate reduction request message separately from a transmission frame of a frame protocol.

26. (Original) The system as claimed in claim 25, wherein, the transmission-rate reduction request message is transmitted through a second interface which is established separately from a first interface through which data frames of the voice signal are transmitted, and includes information of transmission-rate reduction and/or an information element for transmission-rate reduction time, and/or information of an identification number of the mobile station.